



WELCOME TO THE DEPARTMENT OF DEFENSE VIRTUAL ENERGY SUMMIT 2015



Virtual Energy Summit Speakers



Lisa A. Jung
Deputy Assistant Secretary of Defense
(Installation Energy)



Amanda Simpson
Deputy Assistant Secretary of Defense
(Operational Energy)



Richard G. Kidd IV
Deputy Assistant Secretary of the
Army (Energy & Sustainability)



Mark A. Correll
Deputy Assistant Secretary of
the Air Force (Energy)

CDR Jeffery Sherwood
Director of Shore Energy
Office of the Deputy Assistant
Secretary of the Navy



Department of Defense Installation Energy

Lisa Jung

*Deputy Assistant Secretary of Defense
(Installation Energy)*

October 19, 2015

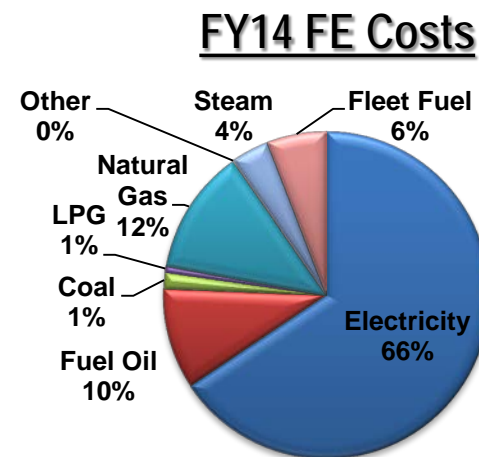




DoD Installation Energy Costs and Consumption, FY2014

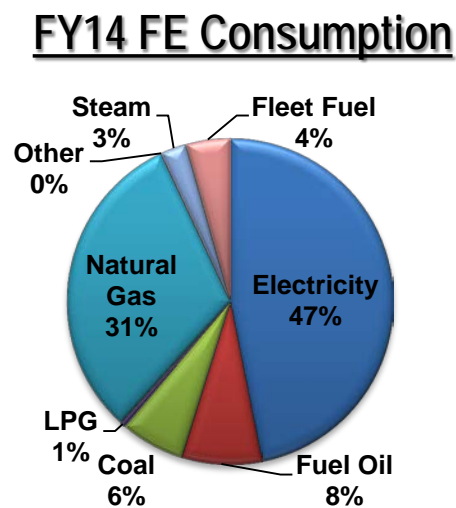
\$ B	Total Energy Costs	Facility Energy Costs
FY14	\$18.3B	\$4.24B (23%)
FY13	\$18.9B	\$4.12B (22%)
FY12	\$20.4B	\$4.02B (20%)
FY11	\$19.4B	\$4.12B (21%)
FY10	\$15.2B	\$4.01B (26%)
FY09	\$13.3B	\$4.01B (30%)

} 3.0% ↑



BBTU	Total Energy Consumption	Facility Energy Consumption
FY14	710,878	214,164 (30%)
FY13	727,707	217,104 (30%)
FY12	806,080	215,075 (27%)
FY11	864,775	224,229 (26%)
FY10	870,200	231,793 (27%)
FY09	920,747	233,426 (25%)

} -1.4% ↓



Installation energy efficiency efforts help DoD to avoid operating costs as prices increase. While IE costs remain level at ~\$4B, DoD has avoided \$1B in new costs since FY09.⁴



DoD Renewable Energy Progress

Air Force Cape Cod
Wind Turbines



Navy China Lake
13.78 MW Solar Array



DoD Renewable Energy Projects

Electricity Generation - 709

Solar - 645

Wind - 32

Geothermal - 17

Biomass - 13

MSW - 2

Thermal Energy - 422

TOTAL PROJECTS - 1,131

**Renewable Energy Capacity:
~ 644 MW**

Source: FY14 AEMR Data



Army
White Sands Missile Range
4.47 MW Solar Array



Marine Corps
Land Fill Gas Facility
MCAS Miramar

*Currently, DoD has 760 MW of RE projects in various stages of procurement with another 1,666 MW in the pipeline. Additional projects will be developed beyond FY2020.*₅

Operational Energy



Amanda Simpson

Deputy Assistant Secretary of Defense for Operational Energy

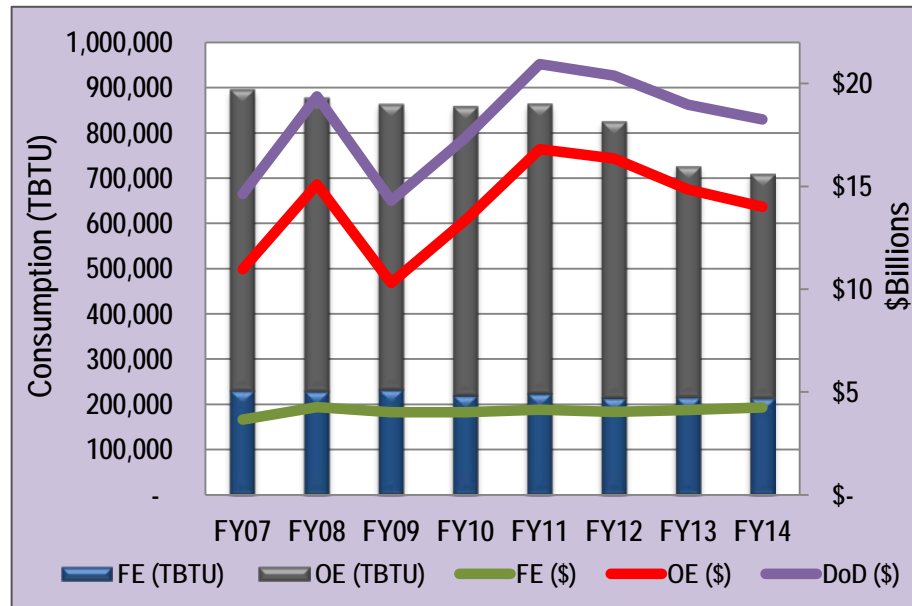
Virtual Energy Week Kickoff

19 Oct 2015

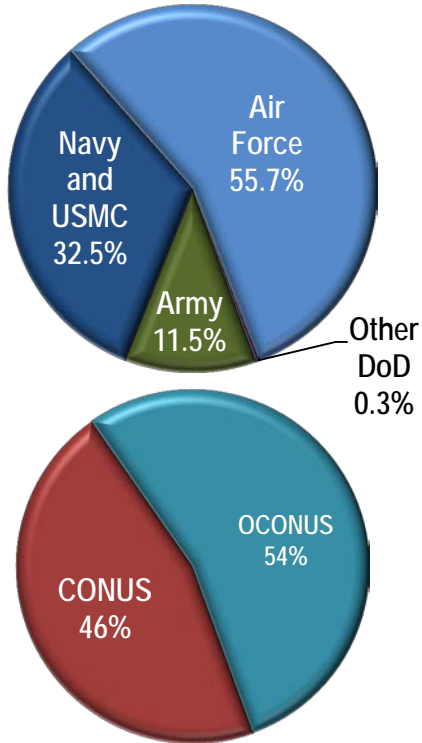


DoD Energy Profile

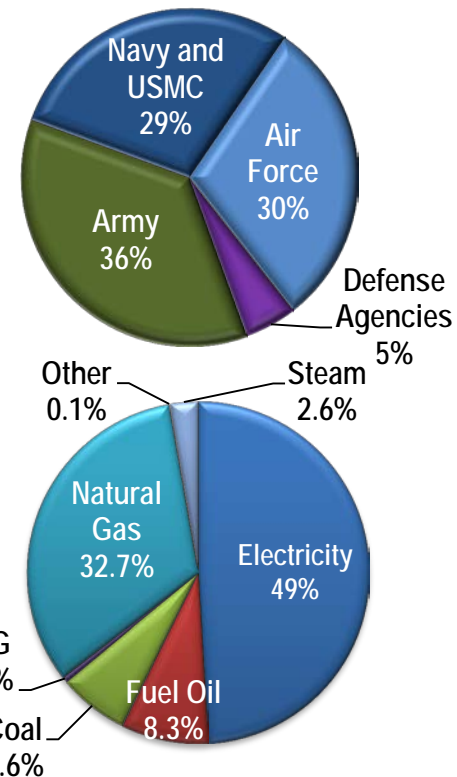
DoD Energy Use and Cost, FY07-14



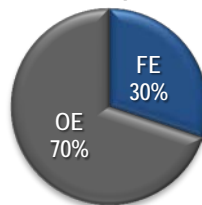
Operational Energy



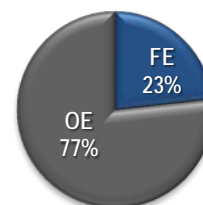
Facilities Energy



Consumption



Costs



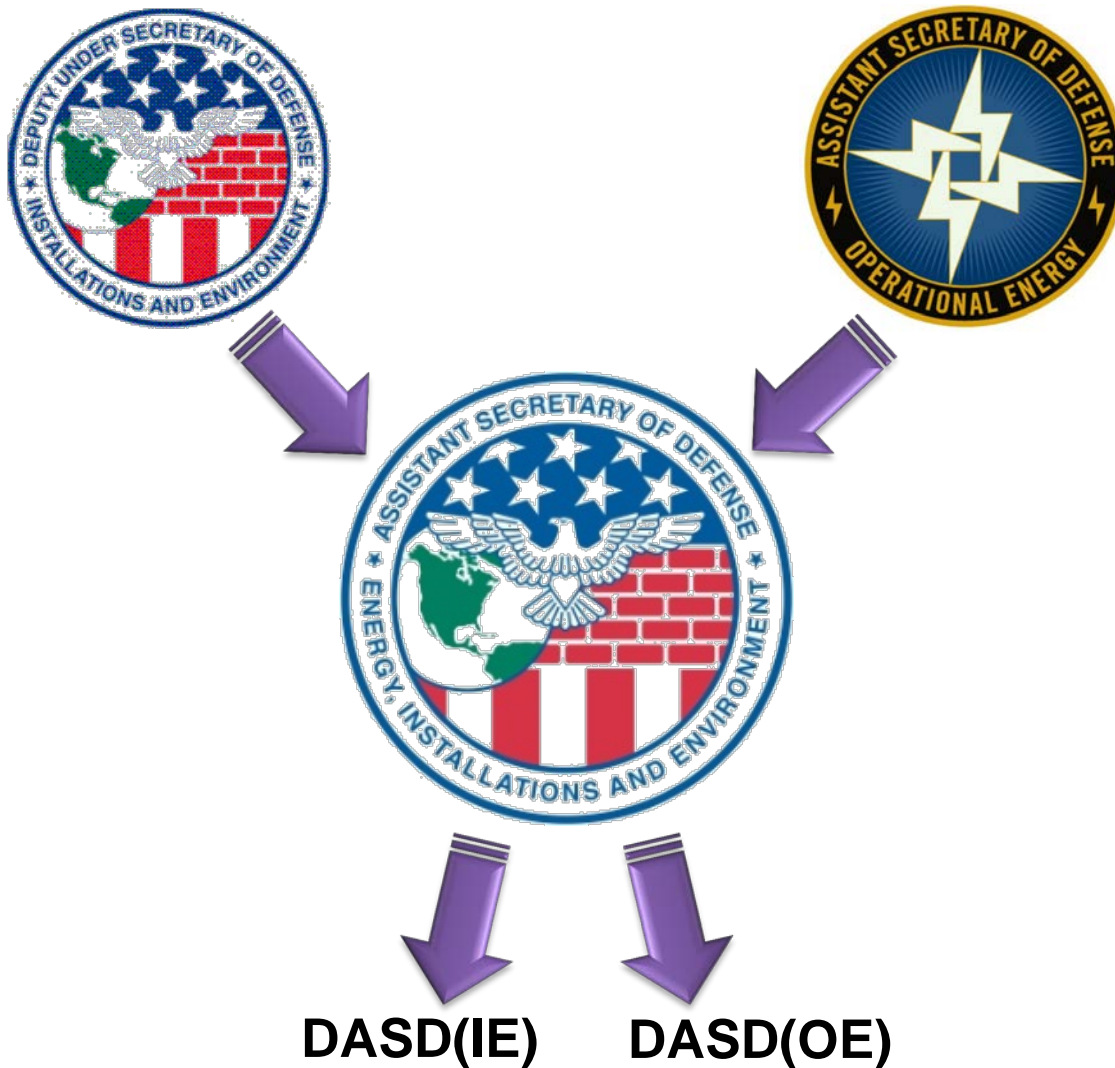
Sources: Annual Energy Management Report, DLA

Operational Energy: Energy required for training, moving, and sustaining military forces and weapons platforms for military operations

Facilities Energy: Energy to sustain activities at permanent military installations, including non-tactical vehicles



Integrating Defense Energy





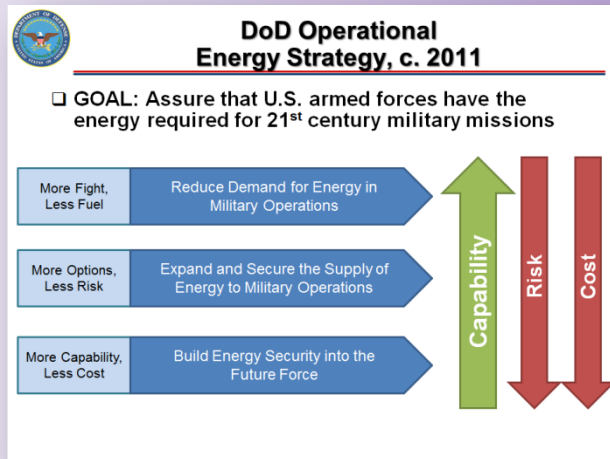
Operational Energy Initiatives

<u>Today</u>	<u>Plans and Concepts</u>	<u>Future Force</u>
<ul style="list-style-type: none">• Strategy, policy, and doctrine• Revised tactics, techniques and procedures• Rapid fielding of improved equipment• Bulk purchases of drop-in, price competitive alternative fuels	<ul style="list-style-type: none">• Energy supportability of plans and concepts of operation• Contingency base master planning• Supply chain risk assessment• Professional military education	<ul style="list-style-type: none">• Energy performance parameters in requirements and acquisition of new systems• Energy supportability of new systems, regardless of ACAT• Operational Energy Capability Improvement Fund• Wargames, modeling & simulation
Operations/Policy	Operations/Policy/Future Force	Policy/Future Force/Innovation

Defense Operational Energy Board (DOEB)



Evolving the Operational Energy Strategy



Objectives

Reduce demand
Diversify supply
Adapt the future force

Priority

Support current operations
in CENTCOM

- Increase warfighter capability
- Identify and reduce logistics risks to mission
- Improve current mission effectiveness

Shift to Pacific

Operations in A2/AD

Improve Resilience



Moving Forward

- ☐ **Still engaged in the current fight**
- ☐ **Expanding energy awareness to other AORs**
- ☐ **Energy Supportability Analysis (ESA) of Plans and Programs**
- ☐ **Application of Energy Key Performance Parameter (eKPP)**
- ☐ **Assessment and Education**

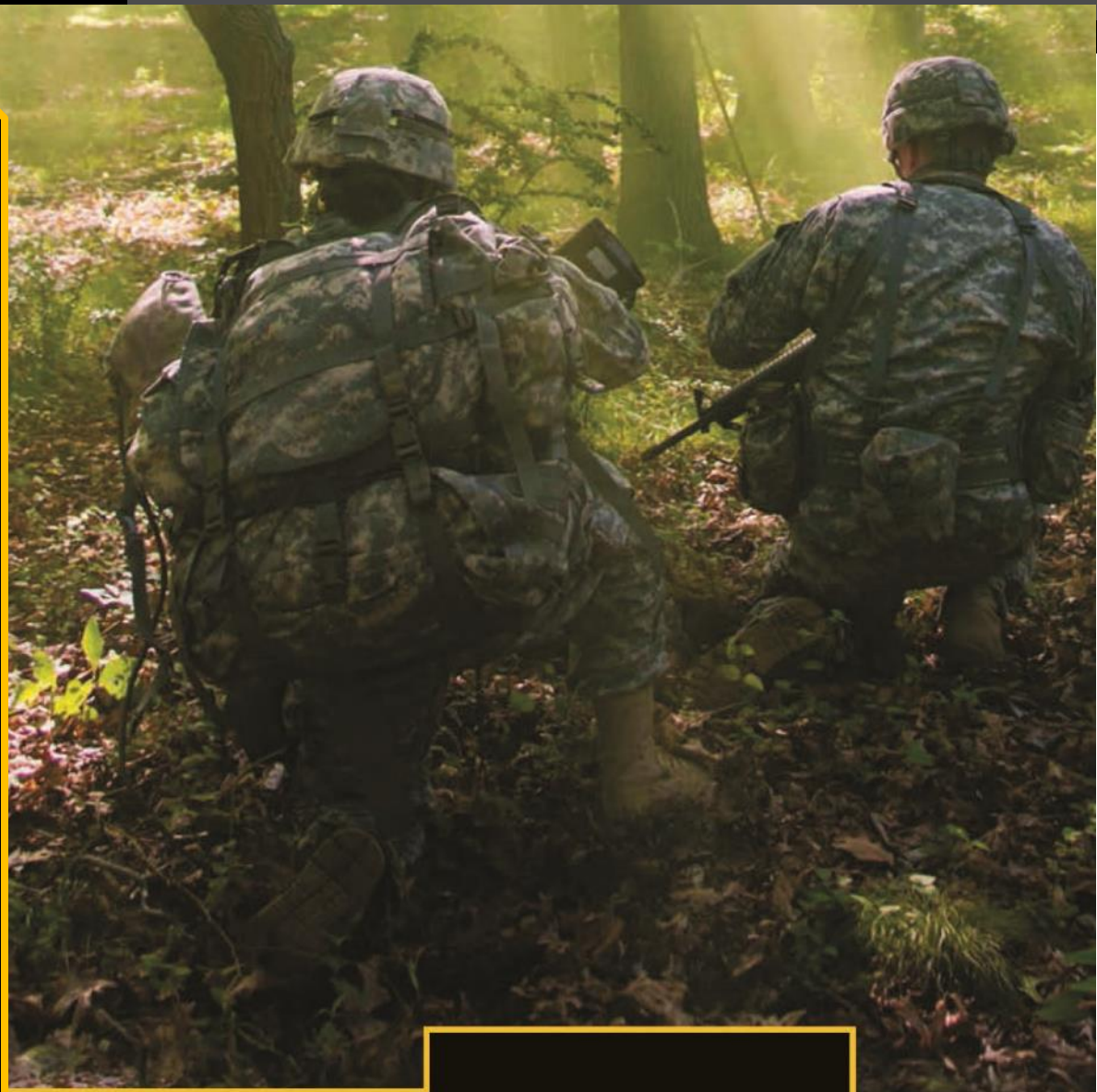


AMERICA'S ARMY:

THE STRENGTH OF THE NATION

ENABLING VICTORY IN A COMPLEX WORLD:

RESILIENT ARMY INSTALLATIONS





Enabling Victory in a Complex World

- The environment the Army will operate in is unknown, and constantly changing
- The enemy is unknown
- The location is unknown
- The coalitions involved are unknown

Resilient Army Installations

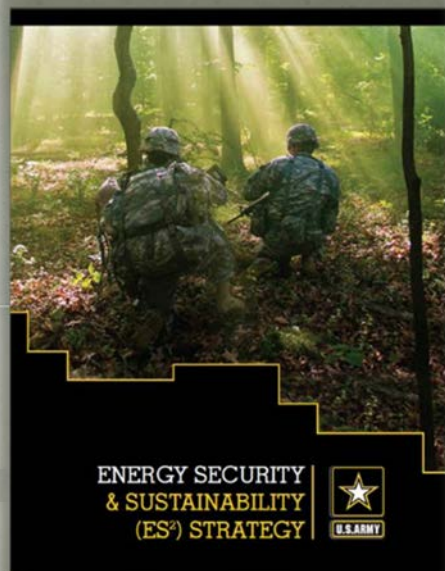
- Maintain continuity of operation to ensure we are ready – trained, equipped, sustained, motivated
- Secure resources through a diversity of options – energy, water, land
- Resilient capabilities to adapt to uncertain, changing conditions such as climate change

Army forces must provide the Joint Force with multiple options, integrate the efforts of multiple partners, operate across multiple domains, and present our enemies and adversaries with multiple dilemmas

Army Operating Concept



Energy Security and Sustainability Strategy



- ES² - Published in June 2015
- Roadmap to future energy security and sustainability
- Foster more adaptable and resilient force
- Prepare for a future defined by complexity, uncertainty and rapid change
- Expands on and replaces the 2009 Army Energy Security Implementation Strategy

"This strategy represents a turning point."

*Under Secretary of the Army, Brad R. Carson,
and Army Vice Chief of Staff, Gen. Daniel B. Allyn*



The ***ES² Strategy*** identifies five strategic goals

VISION



ES² Foundation

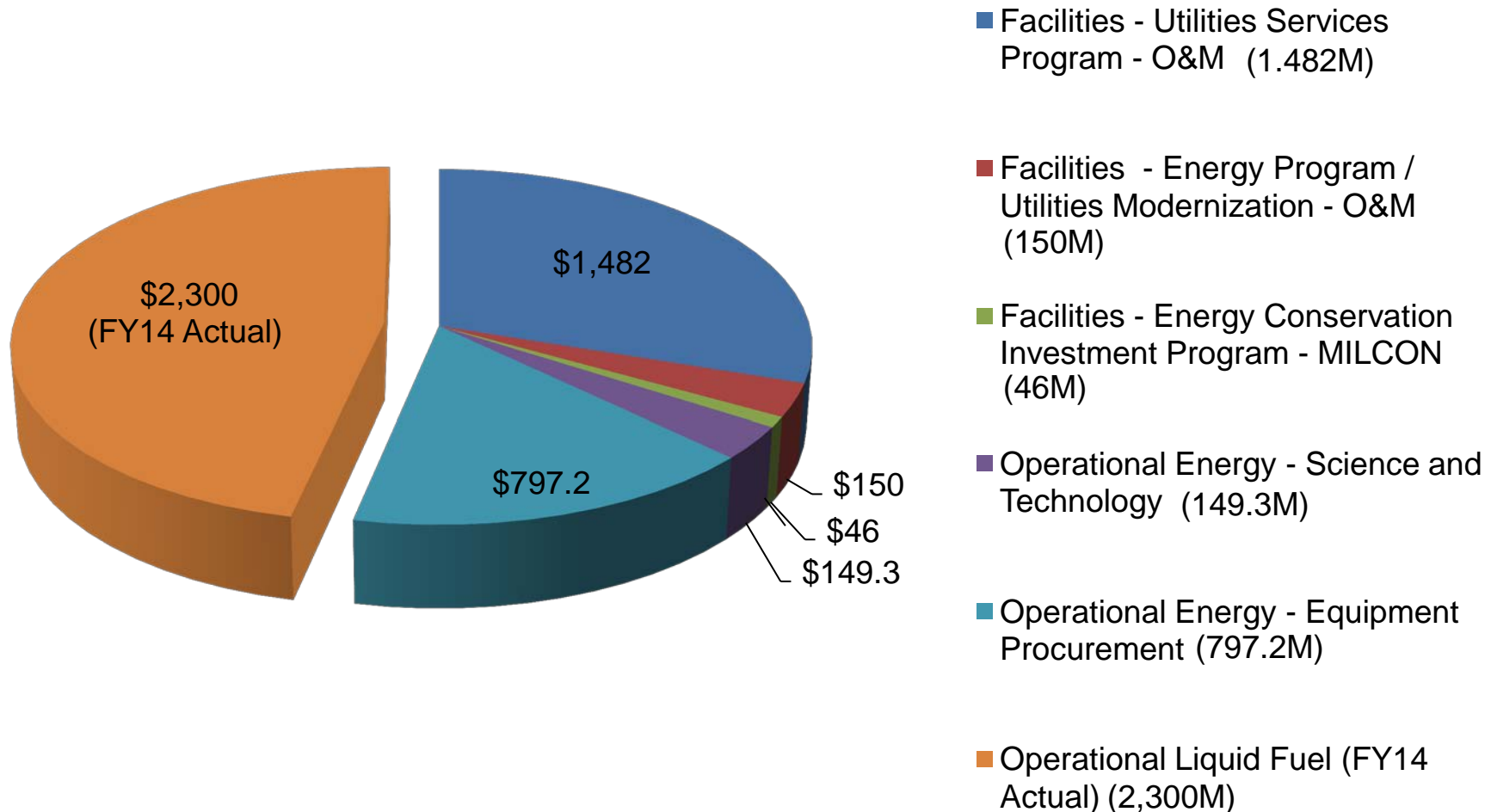
- Inform Decisions
- Optimize Use
- Assure Access
- Build Resiliency
- Drive innovation

Energy Resiliency is the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from service disruptions.



Army FY16 Energy Budget - \$2.625B

(\$'s in millions)





Facilities and Operational Energy

Facilities Energy

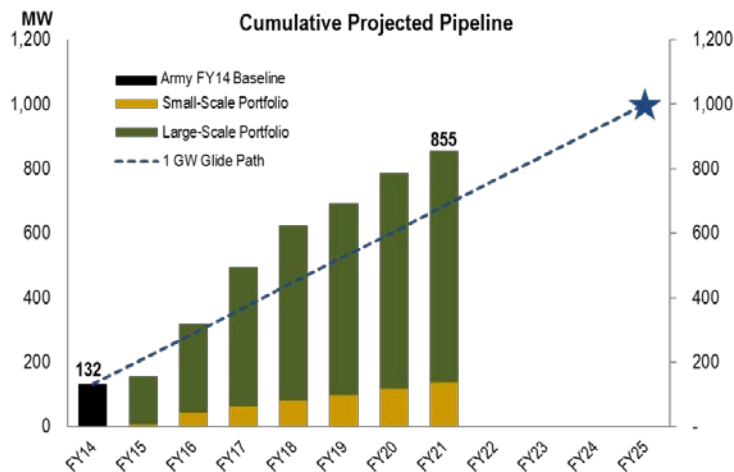
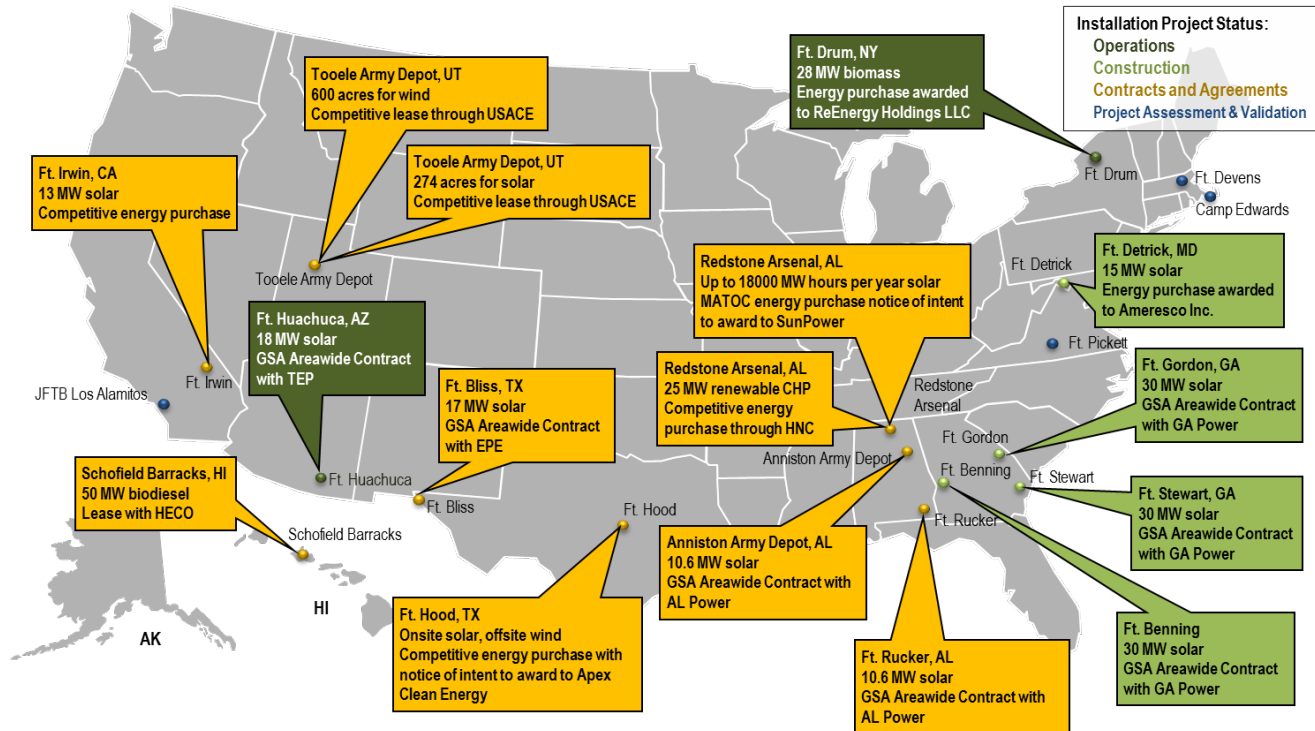
- The largest facility energy consumer in the Federal Government – projects \$1.678 B in FY16
- Since FY03, the Army's total facilities energy consumption has decreased almost 17%, but costs have gone up more than 45%
- Net Zero approach evolved from 17 pilots to Army-wide implementation
- Office of Energy Initiatives (OEI) has deployed 46 MW with an additional 225 MW in procurement and construction
- Largest user of ESPCs and UESCs in the Federal Government
 - \$1.7 B in EPSC task orders awarded at 78 installations and \$588 M in UESC orders awarded at 45 installations
 - Army current fulfills 40% of President's Performance Contracting Challenge (PPCC)
- The Army is investing in science and technology for the development of micro-grids, electric vehicles charging, and vehicle to grid technology

Operational Energy

- The Army spent \$3.6 B on fuel in FY13 and projects \$2.3 B in FY16
- Although liquid fuel requirements are trending downward costs remain almost at the FY10 level
- 70-80% of resupply weight in theater consists of fuel and water
- 40% of fuel goes to produce electricity – we have the technology and know how to save between 30-60% of this amount
- Army is investing in:
 - Deployable hybrid energy systems like Operation Dynamo 1&2 with solar panels, battery storage, and power management systems
 - Tactical microgrids: deployed 36 mini-grids, saving 30 million gallons annually
 - Soldier power initiatives like Squad Power Manager, Modular Universal Battery Charger, Conformal Battery, Intergraded Soldier Power Data System (IPDS)
 - Contingency basing power initiatives like advanced shelters, solar barriers and insulation, efficient lighting, and solar shades
 - Tactical water solutions like a shower water reuse



Renewable Energy



\$671M of planned capital investment leveraged through private sector financing instead of appropriated funds

1:8.2 Private Capital Investment



Energy Savings Performance Contracts (ESPC) and Utilities Energy Services Contracts (UESC)

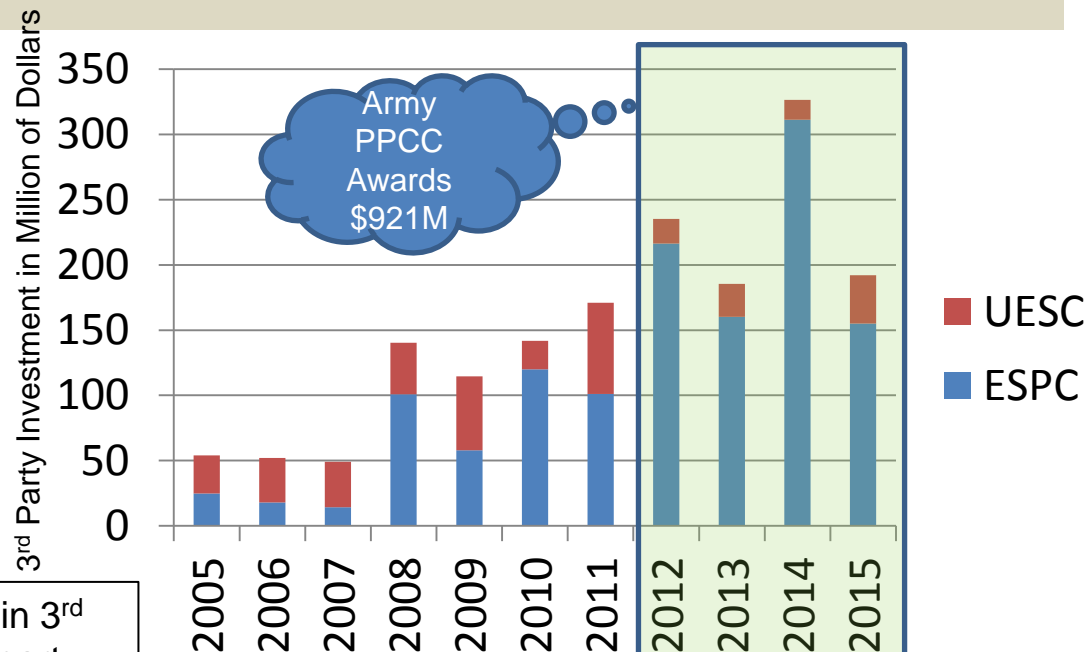
- Private Companies / Servicing Utilities provide initial private capital investment to execute projects
- For ESPCs & UESCs, repayment is from realized energy savings paid from Utilities Services Program funds
- Army has most robust ESPC program in Federal government & improving – Exceeded goal for Ph 1 of President's Challenge
- More ESPCs & UESCs awarded in FY14 (\$326M) than in any single year of the program. FY15 awards total \$192M.

ESPC:

- 238 task orders/mods/ at 78 installations
- >8.19 Trillion BTU Energy Savings per year
- \$1.81 Billion of Private sector investments
- >\$300 Million more in development

UESCs:

- Over 373 task orders/ at 48 installations
- >4.23 Trillion BTU Energy Savings per year
- \$610 Million in Private sector investments
- \$50 Million more in development



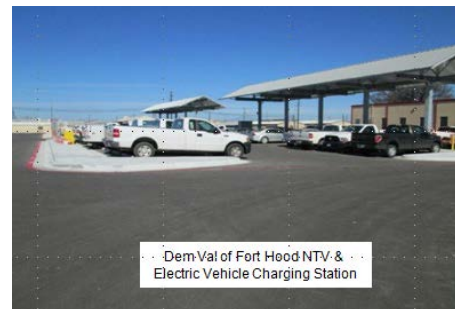
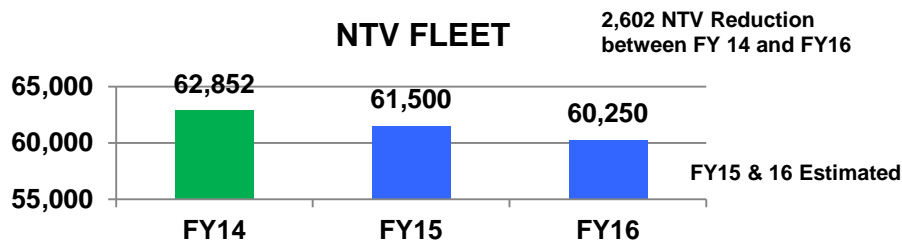
\$3M for development enabled up to \$326M in 3rd party investment in FY14 and \$192M in 3rd party investment in FY15

Army leads Federal Government in 3rd party financing.



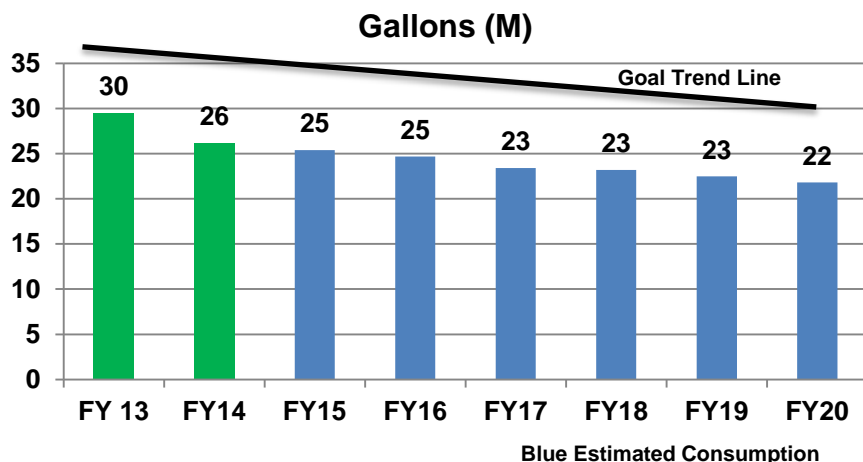
The Army's Nontactical Vehicle (NTV) Fleet is composed of:

- 10,343 Army-owned NTVs
- 156 Commercially Leased NTVs (NTVs not available from the General Services Administration (GSA))
- 52,353 GSA leased NTVs

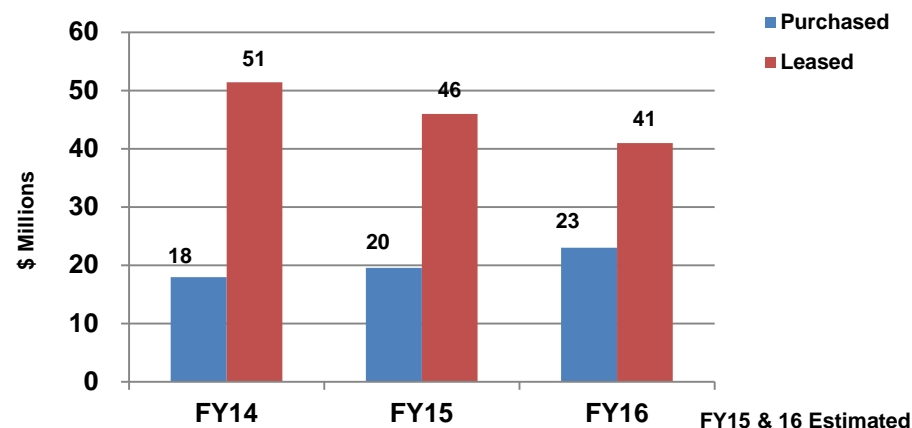


Alternative Fueled Vehicles 53.6%		
Diesel B20	123	0.19%
CNG/Diesel	14	0.02%
CNG/Gas	11	0.02%
CNG	2	0.00%
Electric	251	0.40%
Diesel Hybrid	8	0.01%
Gas Hybrid	3,227	5.16%
E85 FF	24,366	38.93%
Plug-in Hybrid	134	0.21%
Propane	1	0.00%
Low GHG	5,553	8.87%
Fossil Fueled Vehicles		
Diesel	11,003	17.58%
GAS	18,159	29.02%
TOTAL	62,852	

Executive Order 13514 requires a 2% Per Year reduction of fossil fuel consumption between FY05 and FY20 for a total reduction of 30% using an FY05 baseline.



Army NTV Investments Purchased and Leased





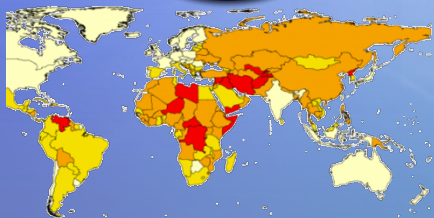
Air Force Operational and Installation Energy

Roberto Guerrero
Deputy Assistant Secretary,
Operational Energy

Mark Correll
Deputy Assistant Secretary,
Energy



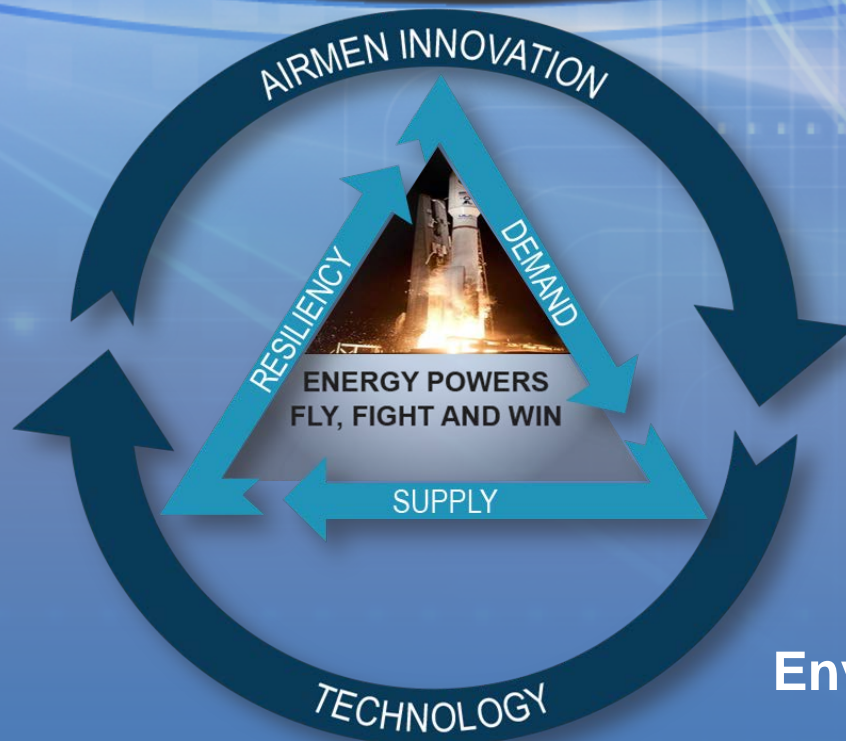
Why, What, and How



Geopolitical Risk



Financial Risk



Mission Risk



Environmental Risk





The Path to Innovation

Ingenuity



Invention

Integration

**Airmen
Innovation**

Innovative Initiatives Starts With Individual Ideas





Mission Assurance Through Energy Assurance

20th Century Solutions

- Utility rate negotiations
- Diesel generators and dual fuel feeds
- Renewable energy to the Grid
- Petroleum Fuels
- Old technologies

**Cost
Effective**

**Resilient
& Reliable**

Clean

**Sweet
Spot**

21st Century Approach

- 20th Century Solutions
+
- Onsite, utility-scale renewable PPAs
- Dual Feeds and Redundancy
- Smart Microgrids
- Alternative Fuels
- Efficient engines
- Modernized Facilities





U.S. AIR FORCE





SECNAV Energy Goals



*Increase Alternative Energy
Department-wide*

*Increase Alternative Energy
Sources Ashore*

Reduce Non-tactical Petroleum Use




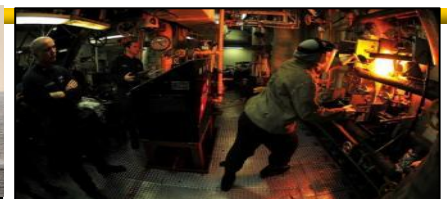











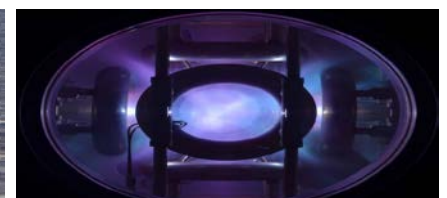
Sail the "Great Green Fleet"

Energy Efficient Acquisitions



Energy Initiatives Afloat and Ashore



Maritime				
	Efficient Ship Systems	Improved Hydrodynamics	DDG-51 Hybrid Electric Drive	Combustion Trim Loop
				
	Operations & Policy	Research & Development	Science & Technology	Flight Simulators
Biofuels				
	F/A-18 Super Hornet	Riverine Combat Boat-X	MH-60S Seahawk	T-AO/CG/DDG/CVN
				
	Solar/Wind/Geothermal	Advanced Metering	Navy's Smart Grid	Advanced Power



USS Makin Island (LHD 8)



LHD 8 is designed with gas turbine engine and electric auxiliary propulsion system (APS)



*Construction & Builders Trials
May 2003 – April 16, 2009*



*Maiden Voyage
July 10 – August 14, 2009*

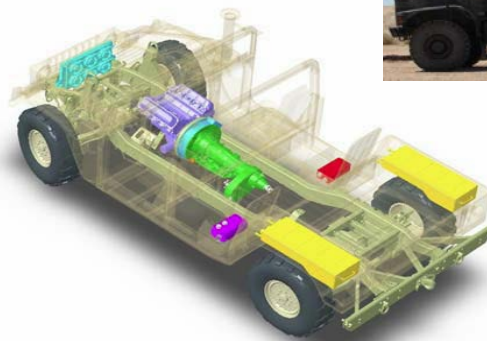


*Commissioning
October 24, 2009*

USS Makin Island: First Demonstration Of Hybrid Electric Propulsion System In Surface Combatant To Expand Tactical Reach and Increase Fuel Efficiency Afloat



USMC Expeditionary Energy

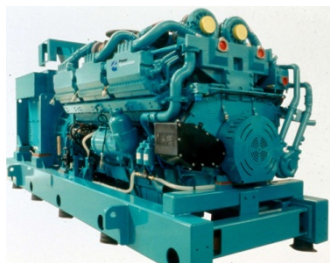
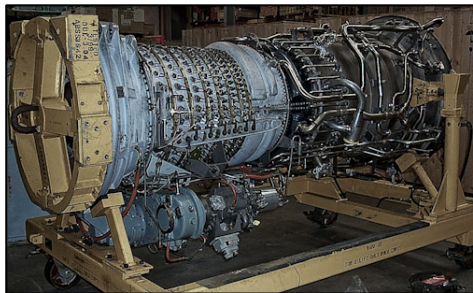




S&T Focus



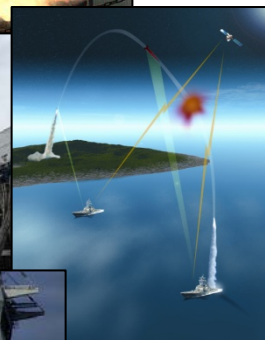
Increased Effort Necessary



Power Generation



Conversion, Storage & Distribution



Advanced Weapons Systems

S&T Goals

Miniaturized
Lightweight
Ruggedized

Enables

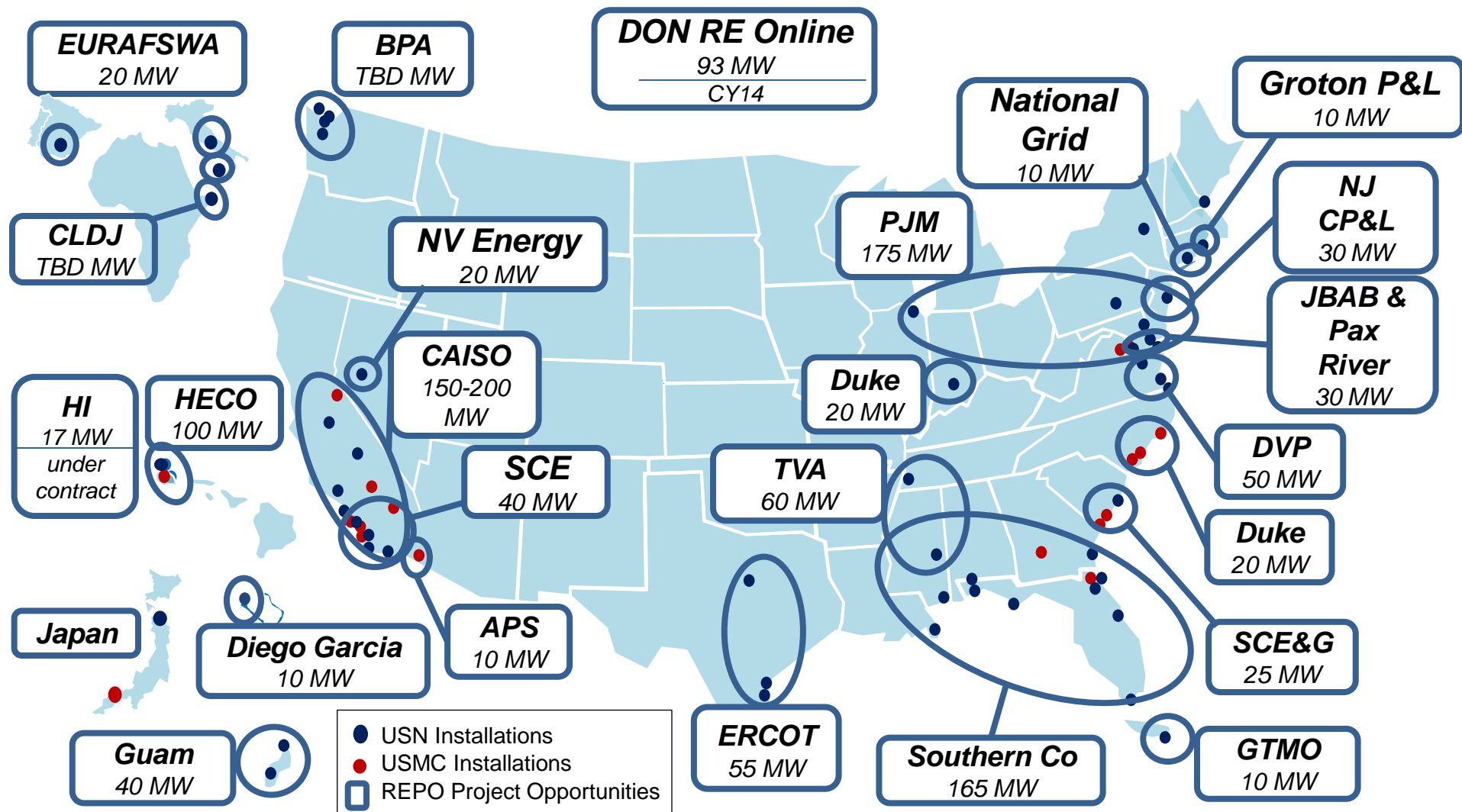
Tactical Gains

Increased
Combat
Capability



REPO Project Opportunities

(as of Nov 2014)



*Projects represent estimates that are subject to change.



Non-Tactical Vehicles

